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Notice of Allowability	Application No.	Applicant(s)	
	10/669,680	WEHRENS ET AL.	
	Examiner	Art Unit	
	Gordon J Stock	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment of 8/11/04.
2. ☒ The allowed claim(s) is/are 1-19.
3. ☒ The drawings filed on 11 August 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input checked="" type="checkbox"/> Other <u>PTOL-413B</u> . |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. E. Rico Hernandez on September 2, 2004.

An amendment to the specification follows to overcome objections to the specification/drawings in action of June 29, 2004 (specifically, page 3 paragraph 2: part 5).

Please replace paragraph [0036] on page 10 with the following:

[0036] To determine the position of the focal plane, projection lens PL projects into space an image of a TIS pattern provided on the reticle RE, having contrasting light and dark regions, as depicted in FIG. 2B. As shown in FIG. 2B, the TIS pattern may be provided along rows (j+1) to (-j-1) of the reticle RE, having constituent marks Txh, Tyh. The layout of the TIS patterns may be characterized by the periodicity of the marks, which corresponds to the distance of the marks along the x-direction as r mm and along the y-direction s mm. The wafer stage WS is then scanned horizontally and vertically so that the aperture TIS passes through the space where the aerial image is expected to be. As the TIS aperture passes through the light and dark portions of the image of the TIS pattern, the output of the photo-sensitive detectors will fluctuate. The vertical level at which the rate of change of amplitude of the photodetector output is highest indicates the level at which the image of TIS pattern has the greatest contrast and hence indicates

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the plane of optimum focus. An example of a TIS of this type is described in greater detail in US 4,540,277. Instead of the TIS, a Reflection Image Sensor (RIS) such as that described in US 5,144,363 may also be used.

Please replace paragraph [00129] on page 20 with the following:

[00129] In one embodiment, the linear and corkscrew reticle RE and reticle stage RS distortions W_r , W_{rs} , C_r , C_{rs} may be resolved by exposing a reticle RE having a specific TIS pattern that enables the reticle RE to be loaded in two distinct orientations (e.g., 0° and 180°) during exposure. As illustrated in FIG. 4, the patterns are configured as sets of marks that are mirror images of each other. As noted above, regarding FIG. 2B, the layout of the patterns may be provided along rows $(j+1)$ to $(-j-1)$ and the distance related to the periodicity of the constituent marks of the patterns are designated as r mm along the x-direction and s mm along the y-direction. With such a pattern, the reticle RE is loaded and exposed with one orientation and then the wafer substrate W is measured. The same reticle RE is subsequently rotated and exposed with a second orientation and then the wafer substrate W is measured again. By so doing, the measurements between the two orientations provide conjugate sets of height offsets that can be applied to equation (10) to resolve the reticle RE linear wedge and corkscrew distortions W_r , C_r .

Allowable Subject Matter

2. **Claims 1-19** are allowed.

3. The following is an examiner's statement of reasons for allowance:

As to **claim 1**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method of calibrating a reticle stage of a lithographic system decomposing a set of measured height offsets into a plurality of distortional factors, in combination with the rest of the limitations of **claims 1-9 and 18**.

As to **claim 11**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a system for calibrating a reticle stage of a lithographic system the particular processing mechanism and reticle stage actuation mechanism, in combination with the rest of the limitations of **claims 11-17 and 19**.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

4. Applicant's arguments, see Remarks, filed August 11, 2004, with respect to rejections under 35 U.S.C. 103(a) in action of June 29, 2004 have been fully considered and are persuasive. In view of the persuasive arguments and the amendment to the claims the rejection under 35 U.S.C. 103(a) of claims 1-4, 6-13, and 15-17 has been withdrawn.

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Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 2004/0130689 A1 to Starikov et al.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and

2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

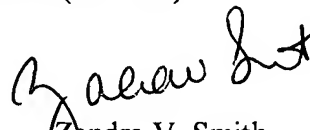
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


gs

September 2, 2004


Zandra V. Smith
Primary Examiner
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